WHAT IS CLAIMED IS:

1. An isolated nucleic acid, wherein said nucleic acid is selected from the group consisting of:

(a) the nucleotide sequence of SEQ ID NO:1;

(b) a fragment of the nucleotide sequence of (a) encoding a functional polypeptide fragment;

(c) a nucleotide sequence that is at least 85% identical to (a) or (b); and

(d) a nucleotide sequence complementary to (a), (b) or (c).

2. The nucleic acid of claim 1, wherein said nucleotide sequence is at least 90% identical to (a) or (b).

3. The nucleic acid of claim 1, wherein said nucleotide sequence is at least 95% identical to (a) or (b).

4. A vector, wherein said vector comprises the nucleic acid of claim 1.

5. A host cell, wherein said host cell comprises the vector of claim 4.

6. The vector of claim 4, wherein said vector further comprises elements necessary for expression, wherein said elements necessary for expression are operably linked to said nucleic acid.

7. A host cell, wherein said host cell comprises the expression vector of claim 6.

8. The nucleic acid of claim 1, wherein said nucleic acid encodes a polypeptide having the amino acid sequence of SEQ ID NO:2.

9. The nucleic acid of claim 1, wherein said nucleic acid encodes a bovine tumor necrosis factor receptor-I (TNF-RI).

10. The nucleic acid of claim 9, wherein said bovine TNF-RI binds tumor necrosis factor (TNF).

11. The nucleic acid of claim 1, wherein said nucleic acid is selected from the group consisting of:

(a) the nucleotide sequence shown in SEQ ID NO:3;

(b) a fragment of the nucleotide sequence of (a) encoding a functional polypeptide fragment;

(c) a nucleotide sequence that is at least 85% identical to (a) or (b); and

(d) a nucleotide sequence complementary to (a), (b) or (c).

12. The nucleic acid of claim 11, wherein said nucleic acid encodes a soluble bovine TNF-RI.

13. The nucleic acid of claim 12, wherein said soluble bovine TNF-RI binds TNF.

14. The nucleic acid of claim 11, wherein said nucleic acid encodes a polypeptide having the amino acid sequence of SEQ ID NO:4.

15. An isolated polypeptide, wherein said polypeptide comprises a bovine TNF-RI.

16. An antibody, wherein said antibody has specific binding affinity for the polypeptide of claim 15 or fragments thereof.

17. The polypeptide of claim 15, wherein said polypeptide encodes a soluble bovine TNF-RI.

18. An antibody, wherein said antibody has specific binding affinity for the polypeptide of claim 17 or fragments thereof.

19. The polypeptide of claim 17, wherein said polypeptide comprises a bovine TNF-RI extracellular domain or fragments thereof, wherein said polypeptide binds TNF.

20. An isolated nucleic acid, wherein said nucleic acid encodes a fusion protein, wherein said fusion protein is encoded by the nucleic acid of claim 11 and a second nucleic acid sequence.

21. The nucleic acid of claim 20, wherein said second nucleic acid sequence is an antibody or fragment thereof.

22. A method of inhibiting TNF cytotoxicity in a bovine animal, comprising:

administering an effective amount of one or more polypeptides, wherein said polypeptides comprise one or more soluble, functional polypeptide fragments of bovine TNF-RI,

wherein said soluble, functional polypeptide fragment(s) of bovine TNF-RI bind TNF, thereby inhibiting said TNF cytotoxicity in said animal.

23. The method of claim 22, wherein said soluble, functional polypeptide fragment(s) of bovine TNF-RI are administered by direct infusion.

24. The method of claim 23, wherein said direct infusion is into said animal's mammary gland.

25. The method of claim 22, wherein said inhibition of TNF cytotoxicity in said animal is for treating mastitis.

26. The method of claim 22, wherein said effective amount is from about 1 µg/kg body weight to about 1 mg/kg body weight.

27. A pharmaceutical composition, comprising:

(a) one or more soluble, functional polypeptide fragments of bovine TNF-RI; and

(b) a pharmaceutically acceptable carrier.

28. A kit, wherein said kit comprises:

(a) at least one unit dose of the pharmaceutical composition of claim 27.